

Portable Amateur Radio History, W7ZOI / 7



W7ZOI/7, Field Day with KD7LXL, 2002, Near Naches Peak, Chinook Pass, Washington State

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Introduction

This web thread deals with portable amateur radio activities where equipment is taken into the field. Amateur radio has sometimes been the main reason for the outing, such as participation in a contest. Just as often, the ham gear has been taken along as a supplement to a hike, a climb, or a backpacking junket. Some folks also carry their ham gear along on trips with bicycles, canoes, or kayaks. All fall into the realm of this discussion.

This site is strictly a personal history of some of the things I have done and does not deal with the activity of others in this area. While many of the photos show operation with friends and/or relatives, this is not a site for a specific club or group. All of my trips have been on foot in the mountains of the US West.

There are other sites on the Internet that specifically deal with portable operations and I encourage the interested reader to investigate them. An especially good one is SOTA, or "Summits on the Air." This organization was founded by Richard, G3CWI and his colleague, G3WGV. Click [HERE](#) to get to the UK web site that will then point to sites in other countries.

Note that Richard is also the author of a column on portable operations in RadCom, the journal of RSGB. Richard really does get out into the field himself and is not a mere armchair adventurer. There are other sites to be found on the web.

There is a down side to the SOTA activity: It tends to emphasize operation from named, documented summits. There are many parts of this country where summits of any kind are rare, yet there is more than abundant opportunity for portable ham operations, perhaps coupled with kayak or canoe boating on water. Land travel may be by foot or bicycle. Even when in the mountains, it is not necessary to be on a summit to garner the thrills and advantages of portable operation. Often an un-named ridge or pass will provide views and antenna opportunities that rival those afforded the summit traveler. I generally just look for good radio locations (that must also be scenic) and do not worry about them being a summit. Alas, by now most of my peak bagging days are past anyway.

The dominant reason for taking ham gear into the field is very simple; it is great fun. But there is serendipity: It is always good to exercise our skills to be ready for an emergency. Amateur radio can be effective in moderately remote mountain locations where nothing else is available, other than some expensive satellite services.

There are two additional factors that motivate us toward portable operation. The first is the restriction often imposed upon us by our lifestyle within society. Many folks live in apartments in cities where antennas are nearly impossible. (Some folks manage to get on the air with attic antennas and the like, but it requires imagination and sometimes a lot of work!) Others live in developed housing areas where antennas are discouraged, if not strictly prohibited. Portable operation may be the ideal solution for the folks fighting these restrictions.

The other factor is noise. This is one that I'm presently fighting, albeit only with marginal success. The noise comes from the many electronic gadgets that are said to *enhance* our lives.

It's hard to find a household that doesn't have numerous computers running. This goes beyond personal computers to include the microprocessors in the microwave oven and the clothes washer. It also includes the insidious digital data converters that supply us with high speed internet, telephone, and high definition cable television services. Light dimmers and touch lamps are other problems. The noise emanating from these sources is relatively short range. Some of it can easily be attenuated merely by walking away from it. I'm amazed how quiet a band can become when I walk a mere quarter of a mile into the woods south of my neighborhood. Some noise sources are stronger and propagate further. These can be heard in the local parks, but completely vanish in the mountains. It is sometimes quiet on the ocean beaches of the West, but not always, for they are often close to civilization.

There is a more esoteric, yet equally important virtue to portable operation -- it provides an activity in our lives that instills a sense of adventure. We need this. Even as a "geezer," I still yearn for the excitement that was more common in my youth. Rock climbing and mountaineering are, alas, little more than memories for me. But I still manage to get out for some hiking, modest backpacking, and even some casual winter snow shoeing. Portable ham radio is often part of these junkets. The radio contacts from the field, even to just the next state, can be more exciting than the best DX garnered from home!

OK, so much for the preface -- let's get to the subject. Some of the things to be discussed are HF contesting from the hills, including Field Day, VHF contests, winter operations, and special events including an interesting, albeit obscure winter QRP version of "field day". But the discussion starts with personal history.

First treks

By the time I started participating in amateur radio (Novice license in 1955) I had already done a little bit of backpacking, starting with Boy Scouts. Both interests grew more or less together and it was reasonable that at one point they would merge. Both activities continue with me, over a half a century after they began. My first hike with radio gear was in July of 1958 with my brother Den. We hiked to the top of Badger Mountain near our home in Eastern Washington and I took a rucksack with a portable rig, a canteen, a nibble of cheese, and some extra ammunition for our 22 caliber rifles, for we were also hunting rabbits and old tin cans.

I had made a *sked* (schedule) with George, K7BFI ahead of time, not knowing if we had a chance of working anyone else. The transmitter ran about a half watt *input* power to a single 3S4 tube powered by a 90 volt "B" Battery while the receiver was a three transistor regenerative job (see QST, July, 1957, p36.) My only photos of that trip did not show the rig or the operation. The rig itself is also long gone, but I hope to duplicate it someday. I vividly remember just how strong George's signals were from the hilltop. I also recall hearing some weak signals in the background that I would never have heard from home. I worked George on both 80 and 40 meters. Noise was absent to a level that I had never experienced. The same rig was included on a mountain backpacking/fishing trek later that summer, but nothing was worked or even heard.

But we had camped at a lake deep in the woods, surrounded by mountains, so it is not surprising that nothing was worked.

WA6UVR/6. (1961-1966)

I finished my undergraduate college experience and got married in 1961 and we left the northwest for California. The move brought a new call, WA6UVR. By now I was doing quite a bit of backpacking and climbing in the Sierra. This was beginning to dominate my amateur radio interests as I read the pages of the publications of the day to find out more about transistors.

I eventually dismantled all of my vacuum tube equipment to garner parts to be used to build solid state gear. The first solid-state station was operational in February, 1963. The first ARRL Field Day with portable gear occurred that year on a trip with WB6AIG (now K6GT.) We drove to a remote spot on the crest of the hills above Palo Alto California, hiked up to the top of a wooded area, strung a dipole in the trees and operated my 1 watt solid state station. It was great fun, something to whet my appetite for trips into the mountains beyond the foot hills. The rig was described in QST for August, 1964. While I remember the strong signals, I also remember problems with the poor dynamic range of the receiver. That issue was to become another passion a few years later.



The photo above shows the first time I combined amateur radio with an overnight backpack and climb. This was Field Day of 1965. I was joined by Chuck Wilcox, K6DMW, on a hike up the north ridge of Mt. Dana in the high country of Yosemite National Park. Our camp (shown in the photo) was on Dana's north ridge at about 12,000 ft. The antenna was a telescoping 12 foot mast that supported an inverted Vee dipole. The experience was overwhelming. I had never

heard 40 meters with such a proliferation of signals, and virtually no noise. The signals were from all over the country, even in the early afternoon when we first got the antenna up. It was also an exciting camp location, much more scenic than the comfortable camps "on the lake" experienced on my earlier fishing motivated backpacking trips. We made only a handful of contacts, but we still regarded the trip as an overwhelming success.



This was the rig on Mt. Dana. The crystal controlled TX (left) ran about 3 watts output. The superhet receiver was filled with Germanium transistors and a two element crystal lattice filter. The overall box was 5 x 6 x 13 inches. In those days we didn't worry much about station weight! Three external 6 volt lantern batteries provided transmitter power. The hike was a 2000 ft elevation gain over scree from Tioga Pass.



This is the north face of Mt. Dana from near our camp, still 1000 ft to go. The summit is reminiscent of Colorado rather than the more typical granite spire summits of California's Sierra Nevada. The next morning produced a common dilemma: Do we continue to operate the radio or do we climb the mountain? We did the climb to the summit, just over 13,000 ft elevation.

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California was a wonderful interlude, but Shon and I wanted to get back to the northwest. When we did, in 1966, I was able to get my old call back. Here's a July 1967 climb to the summit of Washington's Mt. Adams.



(photo by

Andre' Zoutte, WA7IHJ.)

I'm operating at the left. One fellow was holding the antenna mast while another steadied the call pennant in the wind for the photo. Note the RG58 coax blown out by the wind. While the temperature was blistering hot over most of the Pacific Northwest, we were in the middle of a lenticular cloud covering the top 1000 ft of the 12,300 ft peak. We measured the temperature as 38F (3C.) The box near the photo center is the summit register box. We thought at the time that it was attached to a chunk of wood on the ground. We discovered in later years that the wood was actually the roof line of an old summit lookout cabin, placing it 10 ft or so above ground, but buried in ice. The rig on Adams was a modified version of that used on Mt. Dana. It was after this trip that I began to look seriously at schemes for lighter, more compact portable equipment.

So what's this Mt. Adams all about?



Mt.

Adams, 12,307' elevation, as viewed from the Goat Rocks Wilderness, about 20 miles to the north. The Mt. Adams timberline (and road's end) is at about 6000 ft elevation, leaving 6000 feet of hiking to reach the summit. This photo was taken in early July sometime in the early 1990s.

The late 1960s and early 1970s era included a great deal of experimentation, much of it related to rigs for the mountains. Some early direct conversion receivers resulted from some of this work.

Urges to build portable rigs happened a couple of times per year. The "spring" motivation is predictable. But it also seemed to happen in late fall and early winter when Oregon weather is at its ugliest. Two rigs that came out of these urges are the larger "Mountaineer" (QST, Aug 72) and a smaller cousin, dubbed the "Micro mountaineer" (QST, Aug 73,) shown below. The uM was an early version of a topology that became popular using a crystal controlled oscillator to control

both a simple transmitter and a direct conversion receiver, affording an especially simple transceiver.



Both boxes run an output of about half a watt, a level that we concluded was about right for an extended trip (batteries that one can carry) while still offering reasonable performance. Modern batteries (year 1990 and on) will easily support higher output power. Both rigs saw considerable application in the mountains with the right hand photo showing the Micro mountaineer in use, Dec 1972. Operation with gloves or mittens is a must. Both units provided technical direction for equipment to follow. The photo of me operating in the woods was taken by Gene Single, K7IUN. Incidentally, that photo was not posed. I was actually

working VE6WG when the photo was snapped.

Commercial equipment continues to evolve. Consider the photo below:



(N7FKI

photo)

This photo shows a recently introduced, ultra compact and versatile "trail friendly" commercial transceiver, the KX2 from Elecraft. (photo taken in June, 2016). This KX2 belongs to N7FKI. (I eventually bought one too.) This little box is just slightly larger than the Micromountaineer above, weighs just over one pound with battery, offers CW and SSB plus digital modes, and delivers up to 10 watts. It's truly amazing how far things have come.

ARRL Field Day

The ARRL Field Day was often a major activity in my schedule of Mountain/Ham treks. These were often collaborative efforts. Considerable effort was sometimes devoted to building rigs and antennas especially for FD, and in the development of some ancillary tools. The following photo shows a table that could be dismantled and stowed in a pack.



W7EL/7,

late 1970 time frame. The lower shelf houses a transmatch and rather heavy battery while a couple of transceivers and a keyer are on top. One of the transceivers is one that was described in *Solid-State Design for the Radio Amateur*, p214. (ARRL, 1977) Two clip boards were used for this operation. One is for the log while the other is a cross-check sheet. (By now, we were making enough contacts that this was necessary.) A half amp solar panel was included in the mix, although we later discovered that ARRL ruled it *illegal*, for we were using the panel to top off the storage battery. They wanted solar contacts to occur without a storage cell. We had done that often, but not always when in the field. Oh well.

We were picking up some other lore along the way. For example, it was vital to include mosquito nets and/or repellent. But some of the most effective brands of "bug juice" have the nasty chemical property that they react with the classic yellow paint on pencils. So, we often kept our pencils wrapped in plastic.



Another detail that we observed was the difficulty in getting lines into the high trees that we often encountered. We eventually started taking a sling shot and a spinning reel with medium weight fishing line. This tool allowed us to get the antennas up to quite high levels. The limitation now became the weight of transmission line that we were willing to pack in. This photo shows Roy, W7EL, launching a line into a tree. We used 1 or 2 oz fishing weights, but Roy quickly discovered that they were nearly impossible to find in the dark green trees unless the weights were painted. One can now purchase a sling shot of this sort with an attached spinning reel. (Is there no end to the influx of appliances?)

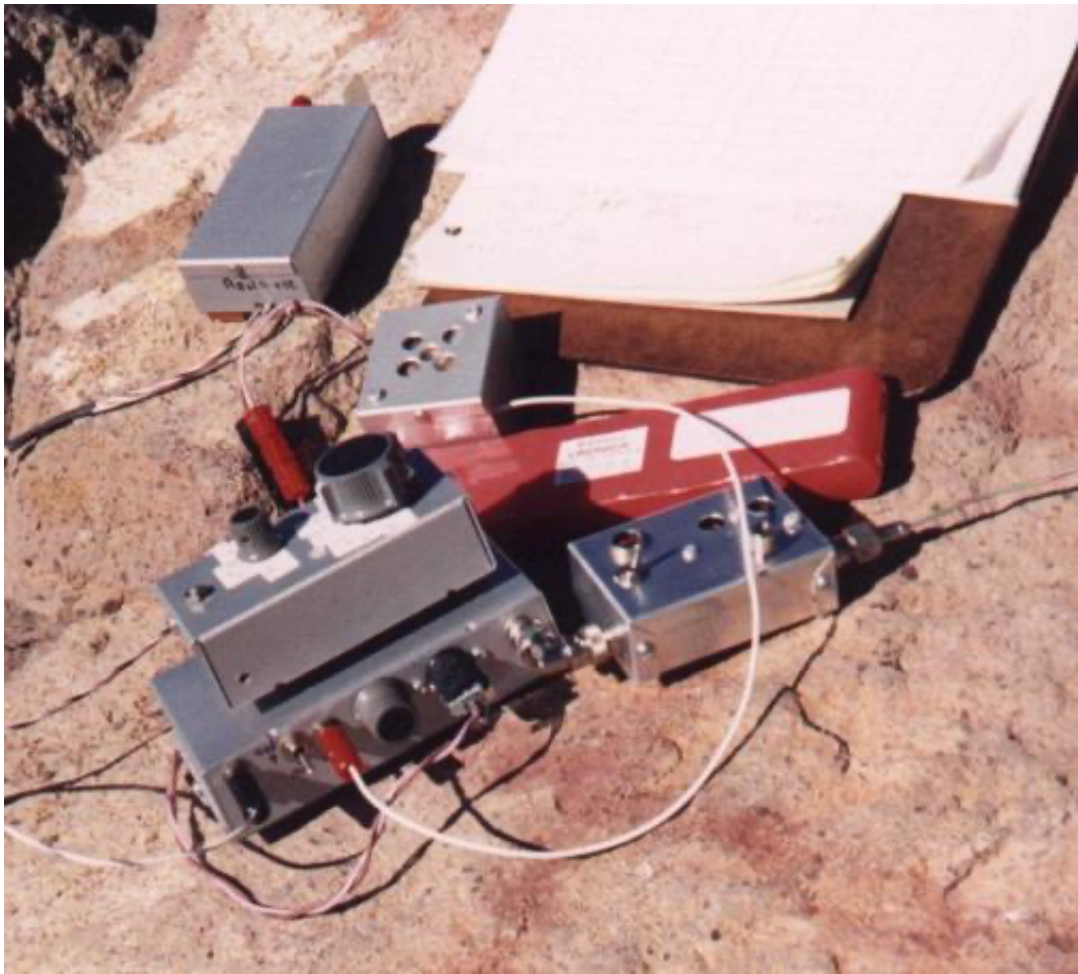
By 1989 son Roger (KA7EXM) had graduated from college and was living in Northern California. He and I decided to meet for Field Day at a location that was half way between us. Oregon's Mt. McLoughlin is a 9500 ft peak just north of the California border. We drove toward each other and met the day before the contest, hiked part of the way in, and and camped. We continued to the summit on the following morning. We operated on Saturday afternoon and Sunday morning, camping on top.



This view shows Mt. McLoughlin from a lake a few miles from the peak.



Here's Rog, just after we reached the top. The peaks on the horizon to the north are around Crater Lake, the Sisters, and beyond. The view to the south was dominated by Mt. Shasta, 50 miles away.



This is the 40M rig used on McLoughlin, a direct conversion transceiver running about half a watt output. The transceiver has a couple of crystals built into it, but also has a VFO that can be used. The VFO is the box riding "piggyback" on the transceiver. The smaller box is a transmatch. The red enclosure houses C sized NiCad batteries. Our "table" was rock at the top of the peak. The right photo shows a stuff bag housing the entire station. The collapsed antenna mast is 14 inches long, but expands to 12 feet; it supported an inverted Vee fed with RG-174 coax. This is the same support used on Adams and Dana. Many thanks again to Chuck, K6DMW, for that 1965 contribution; it has certainly been used a lot!





The left photo above shows the 40 M rig with California's Mt. Shasta 50 miles or so to the south.

The right hand shot shows Roger sitting on a pile of rocks while working our friend, Jeff, WA7MLH. At the time, Jeff was 120 miles to the north where he had packed into and camped upon a ridge near Broken Top in the Three Sisters area of Central Oregon. This was a difficult contact for 2M FM, made possible only because Jeff had carried a small beam with him. (We should have done the same thing.) FM gear can be very useful in the mountains, especially for search and rescue (SAR) groups. It was, however, a profound disappointment in 1989 on McLoughlin. FM simplex activity remains sparse in the Pacific Northwest. (We will have more to say below about VHF Weak Signal work.)



This was our high camp on top of McLoughlin. We used bivouac bags instead of a tent.



One can see some unusual things when camped on top of a peak. Here we see the shadow of our peak at sunset.

McLoughlin was an excellent radio location offering a comfortable, single propagation hop on 40 M to much of the US West Coast. With only half a watt output, we still made a pile of contacts.

While we tend to think of the summit of a peak or pass as being the ideal location, that is not always true. On one trip, Roger and I ended up in a stand of trees well below the pass that had originally been picked from studies of the maps. The pass just looked too hostile as a camp place, especially in the rainy weather we were experiencing.





The pass is at the right edge of the left photo above while our eventual camp is shown on the right. This shot shows me (well, my boots) operating in light rain. This location turned out to be especially good, for the slope behind and below provided a lower angle launch to the east than we would have obtained from the pass. (Roger and I crossed that pass a few years later.) See the now classic book by Moxon for a discussion of dipoles that are below the summit. (L.A.Moxon, G6XN, "**HF Antennas for All Locations**," RSGB, 1982.) That location would be a good one for a return trip. Hmmm.... Roger?

Note that we were camping on snow. This is a common situation for FD, which happens early in the summer backpacking season. Snow normally presents no problems so long as some insulating pads are included for sleeping and operating.

Through the 1970s I often did FD with Jeff, WA7MLH. Sometimes we cheated and operated for a few hours from a location that was close to the car, although it always made us feel guilty. On other trips we went to the south side of Mt. Hood. We did a couple of mid 1980s Field Days from a cool location at an off trail tarn in the Jefferson Wilderness of central Oregon. Here are shots of Jeff and some of the rigs. We are looking across our lake to a peak called Three-Fingered

Jack.



WA7MLH



The gear shown above is a pair of CW transceivers for 40 and 20 M that I used. Jeff had taken rigs along for DSB. He has amassed a great deal of back country experience with SSB and DSB at powers from less than a watt up to about 30 watts. Click [HERE](#) to see Jeff's *most excellent* web site about his appliance-free shack.

Some of the Field Day trips outlined above take on mini-expedition characteristics with a lot of planning and a lot of junk to pack into the hills. FD can equally be a casual event where a minimal rig is thrown into a rucksack and taken out for the day. A FD of this type was to Lookout Mountain in 2005. Lookout is a few miles due east of Mt. Hood. I hiked in by myself, but was then surprised by Rick, KK7B, and his wife Sara, KB8FCZ. Their son, also Rick, K7XNK, was along for the walk. They hiked in and found me on the ridge east of the peak proper. I elected to stay off the peak itself, for it is a popular place for day hikers. Generally, it is best to not pollute the area with the sounds of CW blaring from a speaker, preferring headphones. Also, I generally prefer a bit of isolation from other hikers.





The left photo shows Rick listening to my transceiver while the right shot shows the rig and log book.



This is a 1996 Field Day shot of yours truly making a few final contacts before the antenna was taken down and we hiked out. The weather had been good, but it was starting to rain lightly by the time this photo was taken. This was the last contact before the log book and the gear was shoved into the pack for the hike out. (KK7B Photo.)



The photo above features my grandson, Tom, KD7LXL, digging into his pack to find a rig to go with the antennas we just erected. This was on FD of 2002. The lead photo at the top of this page is also from that 2002 trip near Chinook Pass in Washington. The Goat Rock Wilderness and Mt. Adams hide in the haze further to the south.

Field Day with Single Sideband

I'll admit to being a hopeless CW enthusiast. Like most of the kid hams I encountered when I was in high school, I got my novice license with the thought, "Well, I'll learn the code to get my General and then I'll get on phone." But like many of us, I got hooked on the excitement of CW, especially when I discovered how much more I could do with simple CW gear compared to simple phone gear. Times change. I'll admit that I've had a lot of fun building SSB gear. It's been fun to design it, get it going, measure it, and put it on the air. But I still don't enjoy SSB operation as much as I do CW, even today.

I've operated SSB with low power during Field Day on a few occasions and it has been a lot of fun. Shown below is a 1997 operation at a park about a 10 minute hike south of home.



This transceiver operated on the 40 meter band with an output of about 1.5 W on both SSB and CW. While this may seem like an excessively low power for phone operation, it was still quite easy to make contacts on Sunday morning of Field Day weekend. The SSB transmitter included speech processing in the IF. Although the SSB experience was fun and successful, it was even easier to make CW contacts with the same antenna and power output. Often the CW contacts were much further away than those I did with SSB. At home, this rig was used with an outboard 20 W power amplifier that greatly enhanced the results. See **Experimental Methods in RF Design** (EMRFD, ARRL, 2003) and QST December, 1989 and January, 1990.



The above shot shows an unusual SSB station, this one for the 20 meter band. This was the brainchild of a good friend, Bob Culter, N7FKI. Bob has an Elecraft KX-1 multiband CW transceiver. One of the bands is 20 meters. Bob realized that the internal menus would allow considerable latitude in offsetting the nominal carrier frequency from that received. With this freedom, it was possible to use the transceiver in the receive mode to copy SSB, but to then use the transmitted carrier as injection for a phasing transmitter. Bob based the transmitter on KK7B designs, but with RF circuits redesigned for the 20 meter band. He then built a linear chain ending in a Mitsubishi RD16HHF1 MOSFET running about 8 watts output power. The speech processor in Bob's rig used an Analog Devices SSM2167 integrated circuit. The rig was much more effective with the speech processor in operation. This Field Day operation occurred on the playground of an elementary school close to Bob's house.

Tom, KD7LXL, and I used some SSB on 15 M with his Yaesu FT-817 during FD for 2002. That was close to a maximum in the sunspots and conditions were outstanding. We worked quite a few folks around the US while using nothing more than the 5 watt transmitter output with a 40 meter dipole about 10 feet above the snow. See the lead photo for this web article.

Other Seasons

Field Day is always fun, but amateur radio in the back country is certainly not restricted to that one weekend. Often, Field Day weekend is too early in the season to get to the interesting locations in the western states, for the roads are still snowed in. This varies, year to year. Later in the summer is usually more practical, but does not fit with the amateur radio calendar. In addition, the trips later in the summer are often reserved for more intense backpacking efforts and may not include ham gear. This leaves the most of the rest of the year for ham treks. Spring and autumn are both good. Some of the best radio trips I've done have been in winter. The

earliest of these was a snowshoe trip to Mt. Rainier's Van Trump Park in January of 1970 with Dick Bingham, W7WKR. (I'm still looking for photos from that wonderful trip!)



Here's a photo looking into the entrance of an abbreviated snow cave that I dug on a mid 1980s solo trip. The transceiver is sitting on "the roof," right after keeping a sked with WA7MLH. It was a kick to work Jeff from the field after I had worked him so often from home with him in the hills. Setting radio aside, the mountains are a special place in wintertime with an intense quiet that becomes hard to imagine after the busy, crowded world we normally experience. A quiet radio environment adds to the enjoyment. The contacts are also fun and often unusual. Imagine an early dinner, followed by retirement to the warmth of a down sleeping bag with the transceiver and batteries pulled inside where the wonder of it all is described in the language of CW to the folks who are still at home.



This shot shows another quasi-snowcave. Even without a roof, the shelter trench offers a warm place to relax and protection from the wind. Roger and I dug this one while on a day trek on snowshoes. The goal for that trip was to exercise a new rig in the field. The rig was an updated version of the Micro mountaineer, later presented in QST, July, 2000. The trip was in February, 2000. The larger item on the cave shelf was a stove to make soup for lunch. It's amazing how much warmth is provided by a shelter like this that is dug in only 10 or 20 minutes.



Here's another shot of Mt. Hood from a favorite haunt, a place called Ghost Ridge. This was a trip with my older son, Ron (now KF7HAP) in February of 2007. Mostly it was just a winter camping excursion, but we had a radio goal as well, which was to work a contest called FYBO essentially a winter Field Day for QRP enthusiasts.

VHF Portable

Among the great virtues of being in the mountains is the great panorama presented. The most obvious vista is the visual one, but the mountains also provide an extended radio vista, one that is especially useful at VHF. It's a thrill to operate from a slightly rare grid square that is a long distance from population centers and to generate pile ups on the VHF bands. Over the last dozen or so years I've had the pleasure of going on several expeditions with son Roger, KA7EXM. He has managed to put several interesting grid squares on the air and to make some very interesting, relatively long haul VHF contacts. The modes that he has used are CW and SSB, all with QRP power levels. We always use his call on the VHF expeditions.



(Photo by either KA7EXM or WB6JZY. TNX guys.)

Roger and his work colleague Jack Trollman, WB6JZY, near the summit of Mt. Conness in California's Sierra Nevada Mountains. They had a small 2M Yagi and an Icom IC-202.

Roger's VHF antennas are generally Yagis for 2M and up. A simple dipole is used for 6M. The 6M activity is not usually featured, but is sometimes included merely because his main transceiver, an FT-817, includes that band. The VHF Yagis are those described by WA5VJB. See the articles in CQ VHF, August 1998 and October, 1998. Roger has built these antennas for 144, 222, and 432 MHz with excellent results. He uses a homebrew transverter for 222 MHz. See the article in QST by W1GHZ, January, 2003.





The above two photos show Roger working folks back in Portland on 144 MHz CW and SSB. The location was relatively high, but did not really offer a direct, line-of-sight view of the areas we worked. Still, the signals were very strong and we had no trouble making contacts with QRP gear. This trek was for the 1998 VHF SS, a mid January contest sponsored by ARRL. It's a wonderful excuse to get out on snowshoes.



This photo of Roger is from another VHF SS trip to the same general area on the Pacific Crest Trail.



Roger on the summit of Lookout Mountain, which is due east of Mt. Hood. The antennas for this stack are, top to bottom, 144, 222, and 432 MHz. Click [HERE](#) to see some close-up views of the antennas, showing the construction. The horizontal wire in front of Rog is a 6M dipole. This location was interesting in that Mt. Hood served to shield us from routine signals in the greater Portland area. We were still able to make good contacts to the north and south. Our Portland contacts were limited to some of the BIG stations on SSB, plus one QRP station (KI7N) who was pleased to go on CW to work us. The mast that supports the antennas is made of aluminum tubing of about 5/8 inch diameter with an overall height of about 10 feet. The stack, made from old tent poles, is under a pound and easily fits in a rucksack.

Roger keeps an on-line list of his VHF portable activity. Click [HERE](#) for that list.





Here are a couple of shots of Roger on a trip we took to "tie in rock" above the Elliot Glacier on Oregon's Mt. Hood. We got up to about 8500 feet on this trip, providing a line of sight shot to hills in the Seattle, WA area. The antenna system here was a 5 element Yagi for 144 MHz that was eventually replaced by a 4 element WA5VJB design.



One of the best VHF mountain topping treks we did was to Maxwell Butte in the Mt. Jefferson Wilderness Area of Oregon. Here's Roger working a few guys on 144 MHz CW. For more info and more photos on this trip, click [here](#).

The ARRL approach to VHF contesting differs from that used for Field Day. The FD rules include a "Class B" where one or two people can operate a single transmitter station. This class adapts itself well to backpack contesting efforts. In contrast, the VHF contest rules have a QRP class, but restrict it to a single operator. Because of this, I have rarely participated in any actual station operation on our VHF junkets. There have been moments where I would love to have operated a little, but it is a "single operator" event. Oh well. One approach is to go into the field, work the contest, but to never submit a log or score. Rules don't really matter then. The down side of this is that the published results are not then representative of the actual activity. Even this is of little consequence owing to data-mining that happens with submitted logs.

All of our efforts have been with SSB and CW. These modes are clearly preferred for long distance weak signal applications. FM can still be effective if the location is good enough. FM is also a very useful tool for communications within a group that may be spread out on a trail.



An outstanding location for any mode is the summit of Oregon's Mt. Hood, shown here in May, 1982. Mt. Hood is the highest point in the state of Oregon at a bit over 11,000 ft. It's not usually a difficult climb, but it is slightly technical. The steep snow is not normally a problem, but can become dangerous under icy conditions. KA7EXM in the above photo is giving 2M FM a try. With a few watts and a half wave vertical, he opened repeaters that were 300 miles distant. Roger and a friend, WB7SHE, operated from the summit of the South Sister, another of Oregon's large volcanic peaks, where they managed a 250 mile contact while running only 0.2 W, but that was CW. As an aside, in 2013 I had the pleasure of working Tom/KD7LXL on 2M SSB. Tom, our first grandson, was on the summit of Mt. Hood while I was at home. Surprisingly, that was just the 2nd SOTA activation of Mt. Hood.

UHF Portable

Our main emphasis has been simple HF CW operations. However, son Roger has become quite interested in portable operation with VHF gear. His experience has taken him up through 432 MHz. (Cell phones don't count!) We recently joined John, K7CVU, on a hike to a location that we have visited in the past. But this time we took UHF gear. John had a transverter that ran 2.5 watts output at 1296 MHz. His antenna was a 5 element Yagi that we put atop a small backpacking camera tripod. The IF for the transverter was a Yaesu FT-817.



Here we see K7CVU in 2008 with his 5 element 1296 MHz Yagi. This provided contacts as far away as 168 miles. I suspect that we will try to do more at UHF, for this was extremely fun. Click [here](#) to read about this trek. Update: We did another UHF mountain top trek, this time in May, 2019. The location was the Coast Range of Oregon. John added 2304 MHz this round. Click [here](#) to read about that one.

Equipment Thoughts

Often folks will ask about rigs for portable operation. There are many choices these days including a number of high performance kits. I still prefer to brew my own. The experience is then more complete with the operation becoming an extension of the experiments that led to the gear.

I presently have several 40 M CW rigs that I take to the mountains. One is a VFO controlled superhet shown below.



This transceiver runs 1 watt output and has several features built into it including a frequency counter and keyer. The string of Ni-MH batteries shown will power the rig for a typical weekend of operating, if not longer. (The heavy keyer paddle shown is only used at home!) The front panel LED ceases to function if the battery voltage drops below 11.5. The transceiver weighs just over 1 pound with a receiver current consumption of about 35 mA. Click [HERE](#) to see the schematic for this rig.

Similar gear for the 14 MHz band features improved performance with more power and a stronger (higher dynamic range) receiver front end. This equipment is described in **Experimental Methods in RF Design** (EMRFD, ARRL, 2003).

Commercial gear for the VHF bands is readily available although it is not as common as that for HF. One popular offering is the Yaesu FT-817. The performance has been completely satisfactory, with one major exception: The FT-817 eats batteries alive. On the mountain top contest activities, we have often carried an 8 Amp-Hour Sealed Lead Acid battery to run the FT-817. Starting with a full charge, it is depleted by the end of an overnight contest. The problem is not high transmit power. Rather, it is the excessive current consumed at all times. This results from the use of relays for all band switching. The FT-817 is a good choice if the operating interval is short.

A much older monoband rig offers performance that is, in many ways far superior to the later multiband designs. This example is a classic 2 M SSB/CW rig, the IC-202 from Icom. While the rig itself weighs more and is larger than the FT-817, the total weight per watt is much less when batteries are included. Receive current for the IC-202 is around 70 mA, so it will last for an entire contest with a set of internal C-cells. We have also had good luck with a Mizuho MX-2. This little rig produces a couple of hundred mW of SSB and CW output in a package the size of a traditional 1980s era FM hand held. The Mizuho uses a convenient 9 volt supply.

One portable rig from Elecraft, the KX3, is also noteworthy. This box provides CW and SSB on all HF bands plus 6 Meters. A 2 Meter internal transmatch is an option. This box is quite light weight and has low current consumption and would be an option. A cousin to the KX3 has just (2016) been introduced, the KX2, and it is even smaller and lighter. However, it covers fewer bands.

There is clearly justification for brewing one's own rig for the VHF bands. Numerous examples are included in **Experimental Methods in RF Design** (EMRFD, ARRL, 2003) to serve as a starting point. Several variations of a phasing transceiver for 2M are shown in Chapter 12. A Universal Monoband Superhet Transceiver is presented in Chapter 6 (see page 6.83) with the one shown operating in the 6M band. It could be built for any HF band or even for 2M merely by changing some LC filters and the LO chain. That rig has been a great performer, yielding sporadic E contacts from W1 to Hawaii from Oregon, even at the 3 Watt level with a dipole antenna. Numerous contacts with Japan also happened when we had F2 propagation at a sunspot maximum.

Homebrewing will become necessary as we move to UHF. Some commercial FM gear is available for 1296, and imported SSB/CW transverters are available. But there is no turn-key solution available. Perhaps this is part of the lure of the 1296 MHz band?

How Heavy is the Pack?



This photo shows a vital part of the game, that of at-home testing before taking the gear into the field. In this case, the total weight of the station is determined with a kitchen scale. It's coming in at about 2 pounds, or a kilogram for the set up shown. Note that the keyer paddle, earphones, and battery are included with the transceiver. The antenna system must also be included when planning for portable outings, for that is part of the pack load. After the "weigh-in," the equipment should be set up and used, taking care to add nothing more than the gear that was on the scale. There is an old adage for backpacking that says "Worry about the ounces and the pounds will take care of themselves." This clearly applies to the radio gear that will be carried into the field.

It is very important to use the gear at home just as it will be used in the field. If a commercial rig is to be used, try to set the menu items at home so that frustrations are avoided once on the hill. This is, of course, not a problem with homebrew gear used by the builder, for he or she will know how the menus function!

Some popular antenna solutions can be excessively heavy. The telescoping 12 foot antenna mast that I've used for many years weighs about 2 pounds. It easily fits in a pack and is very robust, so it has been a reasonable solution when traveling above timberline where there are no trees. A better solution is a modern fiberglass crappie type fishing pole that expands to a 20 ft length. It weighs only one pound. It is the preferred solution and is popular with many QRP radio amateurs taking gear into the field, although it does have the disadvantage that it is still long when collapsed. The one I have is 45 inches, so it won't fit inside a pack. It is easily strapped

to the side of one though. A wonderful telescoping mast is available that expands to 33 ft, or 10 M length. It's a great thing if one is going to do an automobile bound portable stint. But that mast weight is 3.5 pounds, making it of marginal utility for most backpacking.

These pack weight comments are predominantly "geezer" considerations and should not be regarded as limitations by younger hams or those used to hauling heavy packs. We hauled large loads in our youth and a few extra pounds in the pack made little difference then. But times change. Most of us tend to be more concerned about pack weight as we add a few years to the tally.

Final Thoughts

Finally, a word of caution: The activities presented here are avocations that we have, by now, pursued for over 60 years. They are not extreme and certainly do not compare with the feats of the modern 21st century backpacker or mountaineer. They can still be more demanding than a trip to the back yard or local park. If these activities are new to you, by all means go with someone who has done them before. Always take the right equipment and know how to use it before you arrive in the woods. Beware of some of the casual, small packs that are sold to the QRP community. These are sometimes found at hamfests or ham-equipment stores. Some of these packs have no room for anything other than the intended rig. Know about the backpacking "Ten Essentials" and always carry them with you when in the back country. (Ref: **Mountaineering: The Freedom of the Hills**, Seattle Mountaineers, 1st Edition published in 1960. The 7th or 8th edition is in print at this time and is still a great book.)

With that said, give some portable operation a try. Even if it is just to a local park, it can still be quite exciting and great fun. Indeed, it may be the most fun that you will ever have in amateur radio. That's been the case with me.